

Supplemental Table S1

Site No. (Fig. S1)	Location Name	Latitude & Longitude		Bed(s) present	Tephra Thickness (cm)	Depth to base of tephra (m)	Probe analysis?	Tephra Sample No.	Dated?	References
Alberta										
1	Barron	N 49.835	W 112.785	G	up to 0.3	~3.25	Yes	B1		Vreeken (1989); Vreeken (1993)
2	Elkwater	N 49.68	W 110.30	G	2	~1.18	Yes	B		Vreeken (1986); Vreeken (1993); Kulig, (1996)
3	Irvine	N 50.022	W 110.232	Irvine		2-3	Yes	UA422, UT29		Westgate and Evans (1978); ; Daniels et al. (1985); This paper
4	Klassen	N 50.887	W 111.228	G	30	15.47	Yes			Campbell (1998)
5	Manyberries	N 49.389	W 110.684	G			Yes	UA130		Westgate (1968); Smith and Westgate (1969); Westgate and Evans (1978); Daniels et al. (1985)
Idaho										
6	Bison rockshelter, Birch Creek Valley (Idaho State College Museum Archeological Site 10-CI-10)	N 44.152	W 112.899	B or G		5.3 to 5.7			Yes	Butler (1961), Powers and Wilcox (1964), Fryxell (1965), Swanson (1972)
7	Bonnars Ferry (southeast of town)	N 48.67	W 116.29							Richmond (1986b)
8	Burnt Knob Lake	N 45.704	W 114.986	G?		3.32	Yes (not published)		Yes	Brunellea and Whitlock (2003); Brunellea et al. (2005)
9	Elmira (north of town)	N 48.488	W 116.466							Richmond (1986b)
10	Hager Pond	N 48.597	W 116.972	G?						Mack et al. (1978b)
11	First Meadow	N 44.46	W 113.31	B?		7				Butler (1984,1986)
12	Kootenai River valley Lower Salmon River (site SR-26)	N 45.805	W 116.313	G? and MSH J G? (also MSH C, Pumice Castle)		~1.1 (re- deposited)	Yes (not published)		Yes	Cochran (1986) Davis et al. (2002)
13	McCall fen (bog)	N 44.94	W 116.04	G	5	3.1	Yes	UA1353		Doerner and Carrara (2001); This paper
14	Onion Puddle	N 44.69	W 111.37	B			Yes			Smith et al. (1977)
15	Poison Lake bog	N 44.648	W 116.169	G	3	2.88	Yes	UA1354	Yes	Doerner and Carrara (1999); This paper
16	Pole Creek kettle	N 43.91	W 114.75	B?	~3 ?	~1.67	No			Cotter et al. (1986)
17	Southwick pedon	N 46.6	W 116.47							Kemp et al. (1998)
18	St. Joe Bog	N 47.03	W 115.98				Yes			Smith et al. (1977)
19	Tammany Creek	N 46.358	W 116.915	G			Yes (not published)	TR-1-T		GeoAnalytical Lab. Database; This paper
20	Van Wyck bog	N 44.527	W 116.161	G	3	3.53	Yes	UA1288	Yes	Doerner and Carrara (1999); This paper
Montana										
21	Baker Lake	N 45.892	W 114.263	G?		3.75	Yes (not published)		Yes	Brunellea et al. (2005)
22	Ben Ryan bog (FL, Five Lakes moraine of Richmond (1986b) may be equivalent)	N 48.48	W 113.98	G	1	2.55	XRF on glass			Carrara (1989)
23	Cabin Creek (Cabin gulch)	N 48.8526	W 114.3433	G (and MSH J)	0.3-0.6	~2.6	XRF on glass			Carrara (1989)
24	Chewing Blackbones bog	N 48.818	W 113.394	G	1	2.4	XRF on glass			Carrara (1989)

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25	Dillon			B			Yes			P. McDaniels (pers. comm., 2008); This paper
26	Diversion Lake (Sun River Canyon) (HS-87)	N 47.6165	W 112.7118	G	0-6.1	2.9	Yes	UA647; 68W21, 68W137, HS- 87	Yes	Powers and Wilcox (1964), Mudge (1967), Wilcox (1969), Lemke et al. (1975), Westgate and Evans (1978), Carrara et al. (1986) Friedman et al. (1992)
27	Divide Lake			G?						Konizeski et al. (1968); Richmond (1986b)
28	Echo Lake kame moraine	N 48.095	W 114.044	G?						Richmond (1986b)
29	Five Lakes moraine (point just NW of FL on Richmond's Fig. 1; possibly equivalent to Glacier Route 7 bog of Carrara, 1989)	N 48.51	W 114.04	G						Richmond (1986b)
30	Flathead Lake - within and north of lake (location approximate)	N 48.08	W 114.17	G?						Moore (1984); Hofmann and Hendrix (2002); Hendrix personal communication in Smith (2004b)
	Flathead Lake - north of lake			G?						Konizeski et al. (1968); Smith (2000); Smith (2004b)
	Flathead Lake region			G?						Smith and Locke (2003); Smith (2004a); Smith (2007)
	Flathead River - fluvial terrace			G?						Hendrix et al. (2004)
31	Gibson Reservoir	N 47.6137	W 112.7579	G?	3 to 5					P. Carrara (unpublished field notes, 1985); Friedman et al. (1992)
32	Glacier Route 7 bog	N 48.586	W 114.021	G	1	4.1	XRF on glass		Yes	Carrara (1989)
33	Goat Lick	N 48.261	W 113.578	G	2-4	30 m above river	XRF on glass			Carrara (1989)
34	Guardipee Lake	N 48.558	W 112.724	r/w G and G (and MSH J)	G r/w - 5 G - 1	5.05 5.53	Yes			Barnosky et al. (1987); Barnosky (1989); Carrara (1989)
35	Howe Lake bog	N 48.6083	W 113.989	G	1	3.55	XRF on glass		Yes	Carrara (1989)
36	HS-86 - Sun river canyon, north side	N 47.63	W 112.86	G?	0-6.1	1.2		68W136		Lemke et al. (1975)
37	HS-91 - Sun river area	N 47.59	W 112.90	G?	~6	0.60		68W141		Lemke et al. (1975)
38	HS-108	N 47.548	W 112.38	G?	~6	0.90		68W147		Lemke et al. (1975)
39	HS-540	N 47.565	W 113.06	G?	~6	2.3		69W19		Lemke et al. (1975)
40	Indian Creek (fossil & Clovis artifact site)	N 46.3067	W 111.6362			~8.3			Yes	Davis (1984), Davis and Grieser (1992), Hill (2006)
41	Kalispel moraine	N 48.271	W 114.330	G?						Konizeski et al. (1968); Richmond (1986b)
42	Kalispell dunes (site #87, and vicinity)	N 48.298	W 114.175	G?	2-3					Konizeski et al. (1968); Waitt and Thorson (1983); Smith (2000); Smith (2004b)
43	Kearns basin	N 45.324	W 112.95	three beds	B? - 1 G? - 2.2 ? - < 0.1	B? - 2.14 G? - 2.19 ? - 2.21	Yes		Yes	Foit et al. (1993)
44	Kerr Dam	N 47.68	W 114.24	G?						Richmond (1986b); Friedman et al. (1992)

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45	Libby Reservoir #5	N 48.465	W 115.283	G (and MSH J)			Yes			Mierendorf (1984)
46	Libby Reservoir #14	N 48.421	W 115.300	G (and MSH J)			Yes			Mierendorf (1984)
47	Libby Reservoir #15	N 48.585	W 115.212	G (and MSH J)			Yes			Mierendorf (1984)
48	Lost Trail Pass bog	N 45.692	W 113.953	B & G ?	B? - 2.3 G? - 1.2	B? - 5.75 G? - 5.77	Yes		Yes	Mehring et al. (1977a); Mehring et al. (1977b); Smith et al. (1977); Blinman (1978); Blinman et al. (1979); Foit et al. (1993)
49	Marias Pass	N 48.30171	W 113.36767	G (and MSH J)	3	~3.5	Yes	UA1268, UA1269, UA1270	Yes	Richmond, (1972); Carrara et al. (1986); Carrara (1989); Carrara (1995); This paper
50	Marias River valley near Lake Elwell			G or MSH J?						Hill (2002); Hill (2006)
51	Marys Frog Pond (core 1)	N 46.64	W 114.58	B & G ?	r/w? - < 0.2 B - 5 G - > 2	r/w? - 3.36 B - 3.55 G - 3.67	Yes		Yes	Mehring (1985); Foit et al. (1993)
51	Marys Frog Pond (core 2)	N 46.64	W 114.58	B & G ?	B - 10 G - > 5	B - 4.81 G - 4.83	Yes			Mehring (1985); Foit et al. (1993)
51	Marys Frog Pond (fen core)	N 46.64	W 114.58	B & G ?	B - < 0.2 G - 0.4	B - 2.76 G - 2.77				Mehring (1985); Foit et al. (1993)
52	Middle fork bog	N 48.23	W 113.56	G	1	3.52	XRF on glass			Carrara (1989)
53	New Rockport (RWL-13)	N 47.847	W 112.020	G	1.5	3.4	Yes	68W20 UA646 UA758		Lemke et al. (1975); Porter (1978); Westgate and Evans (1978); Daniels et al (1985)
54	Otokomi Lake	N 48.717	W 113.599							MacLeod, et al. (2006)
55	Pintlar Lake	N 45.841	W 113.441	B & G ?		9.3 ?	No		Yes	Brunellea et al. (2005)
56	Piper Lake moraine	N 47.623	W 113.955	G						Osborn and Gerloff (1997)
57	Rock lake (possibly the same as "unnamed" lake in Osborn and Gerloff (1997))	N 47.574	W 113.897	G?	10	~2.62	Yes (not in paper)		Yes	Gerloff (1994), Gerloff et al. (1995)
58	RWL-3	N 47.07	W 111.97		3	9-12		69W15		Lemke et al. (1975)
59	Sheep Mountain Bog	N 46.952	W 113.792	G	8	10.58	Yes		Yes	Mehring et al. (1984); Mehring (1985); Foit et al. (1993); Hemphill (1983)
60	Snyder Ridge bog	N 48.58	W 113.878	G	1	2.35	XRF on glass		Yes	Carrara (1989)
61	Tepee Lake	N 48.1625	W 115.407	G	1	4.99			Yes	Mack et al. (1983)
62	Townsend	N 46.35	W 111.5							Friedman et al. (1992)
63	Upper Cold lake Multiple locations in southwestern Montana	N 47.557	W 113.904	G						Osborn and Gerloff (1997) Hanneman and Wideman (2004)
Oregon										
65	Butler Creek Valley	N 45.75	W 119.34	G			Yes	BC-1A		A. Busacca (pers. comm., 2008); This paper
66	Cold Springs Canyon (downwind of canyon at site JC-36)	N 45.892	W 119.012	GP B (and MSH S)		2.4	Yes	JC36-210 UA1409		Sweeney et al. (2005); This paper

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67	Copper Creek	N 44.8	W 119.5	??						Friedman et al. (1992)
68	Sand Hollow	N 45.6607	W 119.5182	G			Yes	LHF2-11-1C	Yes	A. Busacca (pers. comm., 2008); This paper
	Multiple locations in northeast Oregon			B & G					Yes	Palmer et al. (1990)
Washington										
69	Adrian	N 47.4	W 119.4	B			Yes	UA9		Smith and Westgate (1969); Westgate and Evans (1978); Busacca et al. (1992)
70	Almira-Wilbur Rd	N 47.735	W 118.856	G?		0.5	Yes	AW-1A		Smith et al. (1977)
71	Ardenvoir	N 47.740	W 120.362	B and M?			Yes	WENA, WENB		
72	Big Meadows lake	N 48.729	W 117.559			~5.9	Yes			Rigg (1958); Powers and Wilcox (1964); Mack et al. (1978a); Smith et al. (1977)
73	Bishop Spring	N 47.1	W 120.00	B or G			Yes			Huckleberry et al. (2003)
74	Blue Lake, Lower Grand Coulee	N 47.56	W 119.45	B			Yes	UA48		Smith and Westgate (1969); Westgate and Evans (1978); Powers and Wilcox (1964); Fryxell (1965); Friedman et al. (1992)
75	Brewster Flat (location approximate; may be the same as Great Terrace - B below)	N 48.11	W 119.78	?						
	C6123,6124 (location approximate)	N 46.5	W 119.7				Yes	C6123 C6124		Federman (1984)
	Carne Mountain cirque	N 48.09	W 120.81	G, N-C-F, M, T, B						Beget (1984)
76	Chelan Falls area	N 47.764	W 120.027	B, M, & G	B ~30-40 M ~6 G ~4		Yes	T-1.2.4 (B) T-1.2.3 (M) T-1.2.6 (G)		Gough (1995); GeoAnalytical Lab. Database
77	Chiwawa River area (site #1)	N 47.937	W 120.733	B, M, & G			Yes	WEN3		Smith et al. (1977)
78	Chiwawa River area (site #2)	N 47.937	W 120.755	B, M, & G			Yes	WEN6		Smith et al. (1977)
79	Chiwawa River area (site #3) Corfu landslide (location approximate)	N 47.932 N 46.8	W 120.726 W 119.4	B, M, & G B or G ? and MSH J			Yes	WEN6A		Smith et al. (1977) Lewis (1985)
80	Crab Creek (Lamona)	N 47.3104	W 118.5188		6-8	3	Yes	CX 4027, 889		Booth (1971); Federman (1984); Stradling and Kiver (1986); Moody (1987)
81	Creston Bog (fen) (Also known as Wilbur bog. Sources disagree on site location.)	N 47.74	W 118.47			~ 2	Yes			Rigg (1958); Powers and Wilcox (1964); Czamanske and Porter (1965); Fryxell (1965); Mack et al. (1976); Smith et al. (1977); Richmond (1986b)
	CX2015	N 47.765	W 120.028				Yes	CX 2015		Federman (1984)
	CX2060,61	N 47.764	W 120.048	B and G ?			Yes	CX 2060, CX 2061		Federman (1984)
82	Dailey Lake bog	N 48.458	W 117.809	G (and MSH J)	0.5-0.8	3.45	Yes		Yes	Carrara and Trimble (1992)
83	East Wenatchee (Richey Clovis Cache)	N 47.406	W 120.202	G?			Yes			Mehring and Foit (1990), Foit et al. (1993). Gramely (1993)
84	Entiat River area (site #4)	N 47.995	W 120.58	B, M, & G			Yes	WEN7		Smith et al. (1977)
85	Entiat River area (site #6)	N 47.995	W 120.58	B, M, & G			Yes	WEN9		Smith et al. (1977)

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86	Frater Lake (two adjacent cores)	N 48.656	W 117.484	G (and MSH J)	0.6-0.8	6.1	Yes	UA1239, UA1264		This paper
	Gamma Ridge	N 48.1366	W 121.079	G, N-C-F, M, T, B						Beget (1985)
	Glacier Meadows cirque	N 48.054	W 121.160	B ?						Beget (1981,1984)
87	Goat Mountain	N 48.02	W 119.98	G			Yes	UA11		Westgate and Evans (1978)
88	Goose Lake	N 48.17	W 119.345	G ?						Mehring (1996); Nickmann and Leopold (1985)
89	Grand Coulee	N 47.6199	W 119.414	B		1.5	Yes	GC-2A		Busacca et al. (1992)
90	Great Terrace - A (location approximate)	N 47.88	W 119.95							Mack et al. (1979); Waitt and Thorson (1983); Richmond (1986b); Chatters and Hoover (1992)
	Great Terrace - B	N 48.140	W 119.695			~3.5 (multiple layers)	Yes	803, 804, 805, 806, 807		Moody (1987)
	Harmony Park cirque	N 47.14	W 121.08	G, N-C-F, M, T, B						Beget (1981,1984)
91	Horse Heaven Hills (location approximate)									A. Palmer p.c. in Sweeney et al. (2005)
92	Keller Ferry	N 47.940	W 118.640							Stradling and Kiver (1986)
	Larch Lake moraine	N 47.725	W 120.908							Long (1989)
93	Lind Coulee (Feed Lot site, location 12 in Moody (1977) and Cattle Yard site, location 14 in Moody (1987); location approximate)	N 47.01	W 119.01	B & G, (and MSH J)			Yes	UM15-7, UM15-8, UM15-9, UM15-10, UM15-11		Moody (1977); Moody (1978); Moody (1987); Carrara and Trimble (1992)
94	Little Pend Oreille river	N 48.466	W 117.774	G, (and MSH J)	r/w? 0.2-0.5 G 0.2-0.3		Yes			Carrara and Trimble (1992)
95	Lower Grand Coulee, east side, about 5 km N of Soap Lake	N 47.46	W 119.51	B			Yes	UA645	Yes	Fryxell (1965); Smith et al. (1977); Westgate and Evans (1978); Moody (1987)
96	Lower Grand Coulee, east wall, about 8 km north of Soap Lake	N 47.48	W 119.51							Fryxell (1965)
97	Marmes rockshelter	N 46.614	W 118.203	?? (Possible problem with tephra ID.)			Yes (by Ray Wilcox, U.S. Geological Survey)		Yes	Fryxell and Keel (1969); Gustafson (1972); Sheppard et al. (1987); Huckleberry and Fadem (2007)
98	McFeely Road	N 46.312	W 118.456	B			Yes	UA 1418		P. Spencer (pers. comm., 2008); This paper
99	Meadow Creek landslide	N 48.03	W 118.68	B & G						Stradling and Kiver (1986)
100	Nat cave (Natural Cave?) archaeological site	N 47.5	W 119.5	?						Fryxell (1965); Friedman et al. (1992)
101	North Sugarloaf	N 47.80	W 120.57				no (INAA on glass)			Doak (1969); Borchardt et al. (1971)
102	Omak lake bog	N 48.25	W 119.43							Richmond (1986b) - cites B.F. Atwater, pers. commun. (1983)

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103	Orondo - Chelan Falls area	N 47.6555	W 120.2015	B, M, & G	B ~18 M ~6 G ~4		Yes	T-2.4.1 (B) T-2.4.8 (M) T-1.2.6 (G)		Gough (1995); GeoAnalytical Lab. Database
104	Park Lake archaeological site	N 47.59	W 119.4	?						Fryxell (1965)
105	Porcupine Bay	N 47.88	W 118.15	B & G and 2 others						Stradling and Kiver (1986)
106	Purtteman Gulch	N 47.9	W 120.06	B			Yes	UA8		Westgate and Evans (1978); Smith and Westgate (1969)
	Quincy Basin, north-central part RM-6 (location approximate; may be equivalent to Great Terrace site - B)	N 48.15	W 119.7				Yes	RM-6		Dalman et al. (2005) Federman (1984)
107	Selah Creek	N 46.681	W 120.132	G, MSH J			Yes	SEC.96.2		J. Galm, pers. comm., 2008; This paper
108	Sentinel Gap	N 46.773	W 119.966	G			Yes	45KT1362-A		Huckleberry et al. (2003); S. Gough (pers. comm., 2008); This paper
109	Shady Pass	N 47.981	W 120.504	B, M, & G			Yes	WEN8		Smith et al. (1977)
111	Soap Lake (matches coordinates of Lake Bretz site of Moody (1978), but Moody's description refers to the mollusk-dated Lower Grand Coulee site of Fryxell (1965) above)	N 47.41	W 119.49	B			Yes	UA12		Westgate and Evans (1978); Smith and Westgate (1969)
112	St. Andrews Jct	N 47.70	W 119.41	B			Yes	UA10		Westgate and Evans (1978)
113	Starvation Flat bog	N 48.484	W 117.698	G, MSH J	1.0-1.3 graded bed	2.1	Yes			Carrara and Trimble (1992)
114	Steptoe Canyon (location approximate)			?			no (INAA on glass)	27-1		Czaminske and Porter (1965); Theisen et al. (1968); Borchardt (1970); Borchardt et al. (1971)
115	Thunder Lake	N 48.6963	W 121.1085			5.8	Yes	TL2F UA1291	Yes	Spooner and Brubaker (2007); This paper
116	Trinity mine (also called Phelps Creek site)	N 48.075	W 120.851	I, G, N-C-F, M, T, B	B - 111 T ~4 M ~7 F+C+N ~25 G - 169 I ~20		Yes	UA147 (B) UA148 (G) (see also Table 2)		Czaminske and Porter (1965); Steen and Fryxell (1965); Doak (1969); Wilcox (1969); Borchardt et al. (1971); Westgate and Evans (1978); Gardner et al. (1998); This paper
117	Vantage	N 46.89	W 119.99	B ?			Yes			Smith et al. (1977)
118	Washout Gulch	N 46.597	W 120.297	G	5	1.2	Yes	45YA579		GeoAnalytical Lab. Database; This paper
119	Waits Lake	N 48.176	W 117.791			8.8	Yes			Mack et al. (1978c); Smith et al. (1977)
120	Wildcat Lake	N 46.727	W 118.158	B & G	B - < 0.2 G - < 0.1	B - 26.38 G - 26.57	Yes		Yes	Foit et al. (1993); Blinman (1978); Blinman et al. (1979)
121	Williams Lake Fen	N 47.337	W 117.661	B & G, 2 MSH J ?	B - 1.1 G - 0.7	B - 10.56 G - 10.59	Yes	UA1292	Yes	Nickman (1979); Foit et al. (1993); This paper
122	Yakima Canyon	N 46.849	W 120.461	G		1.1	Yes	1994.1B		B. Lenz (pers. comm., 2008); This paper
123	Zangar Junction	N 46.078	W 118.844	B			Yes	UA 1421 (45- WW-100)		GeoAnalytical Lab. Database; This paper

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	Additional locations in central Washington									Fryxell (1965)
	Additional locations in Douglas County (in soils)									Busacca et al. (2001)
Wyoming										
124	Alder Lake	N 44.337	W 110.312	B?	1	8.95				Sherrod (1989); Tiller (1995)
125	Cub Creek Pond, Yellowstone NP	N 44.497	W 110.197	B		~0.82	Yes	UA648		Waddington and Wright (1974); Smith et al. (1977); Westgate and Evans (1978)
126	Cygnets Lake Fen	N 44.66	W 110.61	B or G	~1	5.44	No		Yes	Whitlock (1993)
127	Divide Lake	N 43.945	W 110.233	B or G	~1	3.06	Yes (not published)		Yes	Whitlock (1993)
128	Emerald Lake	N 44.069	W 110.309	B or G	~1	5.21	Yes (not published)		Yes	Whitlock (1993)
129	Fallback Lake	N 43.967	W 110.440	B or G	~1	4.54	Yes (not published)		Yes	Whitlock (1993)
130	Lewis Lake core LL2	N 44.297	W 110.631	r/w B?	0.3 r/w?	10.17	Yes			Tiller (1995)
131	Lily Lake Fen	N 43.772	W 110.324	B or G	~1	11.41	Yes (not published)		Yes	Whitlock (1993)
132	Mariposa Lake	N 44.152	W 110.241	B or G	~1	4.33	Yes (not published)		Yes	Whitlock (1993)
133	Slough Creek Pond, WY	N 44.925	W 110.353	B or G						Whitlock (1993)
134	Yellowstone Lake core FD2-92	N 44.441	W 110.393	B?	3	8.43	Yes		Yes	Tiller (1995); Theriot, et al. (2006)
135	Yellowstone lake shore (SW of Indian Pond) Yellowstone Lake shore, three sites	N 44.555	W 110.32	B?						Richmond (1976); Richmond (1977); Tiller (1995) Richmond (1986a)
Saskatchewan										
136	Friday (site 7)	N 49.852	W 109.568	G	0.3	~10.2	Yes	UA1261		Vreeken (1999)
Offshore										
137	Core TT063-13	N 47.142	W 125.280			4.01-4.05	Yes (not in abstract)			Wan et al. (1994); Wan et al. (1995)